

ART. IX. *Inquiry into the Causes, Nature, and Treatment of Hernia Cerebri.* By J. W. HEUSTIS, M. D. of Cahawba, Alabama.

THE importance of the integrity and sound condition of the brain to the healthy, rational, and perfect performance of the various intellectual and corporeal functions of the human system, is a physiological fact, which few at the present day would have the scepticism or heresy to deny. Yet exalted as are the offices of this organ, experience teaches us that it is capable of enduring serious injury, without destroying or endangering life. That these injuries impair to a greater or less degree the functions of the animal economy, is obviously true; but the wonder and surprise are, that in many instances the effect should be so apparently trivial and disproportionate to the cause. Thus, experiments on the inferior orders of the animal creation show that the brain may be sliced away to near the basis of the skull without the immediate destruction of vitality; and even in the human subject the skull may be extensively fractured and driven in, the periosteum abraded, the dura and pia maters lacerated, and even a portion of the brain lost in consequence of the injury, and yet the patient recover. If then the brain can suffer such severe and extensive injury without destruction to life, the inquiry might suggest itself, what are the extent and degree to which this organ may suffer injury and violence without endangering the life of the individual. But as we have no scale by which we may accurately measure the grades of suffering and derangement of the animal system, we must leave this inquiry where we found it. This, however, we do know, that if the external violence or internal lesion exceeds a certain degree, death is the inevitable consequence.

Mere fracture of the skull, although extensive, is not generally fatal. And in cases of external violence done to the head, as from blows and falls, death is perhaps owing more to concussion than to pressure upon the brain, either from the bone externally, or from extravasation of blood within. It is true, that in cases of severe fracture, the intellect is generally deranged and impaired, the person lying more or less comatose and insensible, the stomach sympathetically affected, weak and irritated, rejecting its contents; the eyes squinting; the limbs paralytic. &c.; yet the presumption is that most of these symptoms are owing to concussion, which is always a necessary consequence, in a greater or less degree of such violence as causes a fracture of the bones of the cranium; and what is more conclusive upon this point is that such symptoms may, and do occur

without any fissure or depression having taken place. But although in injuries of this nature, life may not be destroyed by the mere pressure of the bones upon the subjacent cerebrum, yet where symptoms of the character above mentioned exist, we are certain that the injury received is urgent and severe, and such as demands the immediate interference and aid of medical discretion and surgical skill. The worst fractures that I have ever seen, were unaccompanied with laceration of the integuments; still the touch, the unequal feel, the tumid and ridgy hardness, the puffy softness, and in addition to all, the stupor and abolition of intellect, were strong and positive assurances of the extent and severity of the subjacent mischief. Upon making a crucial incision and dissecting up the integuments, we find, perhaps, extensive fissures in different directions; sometimes laying open the sutures, extending from ear to ear, or stretching obliquely, and bursting open the socket of the eye, with a considerable portion of the coronal or parietal bones broken and depressed; and not unfrequently a portion of the brain forced out upon the surface of the skull in the same manner that a heavy blow, or great pressure upon the yielding ice, causes the subjacent fluid to escape by the nearest opening. Now, as the cerebral mass fills completely the cavity of the skull, any considerable pressure upon it from any cause, or in any part, more than it is able to sustain, must produce a tendency in the brain to escape by any opening that may accidentally exist; as it is in this way, from great external violence and injury done to the brain and its membranes that *hernia cerebri* owes its origin, the foregoing remarks I trust will not be considered irrelevant to the subject.

In many instances these fungi or cerebral hernia are not attended with any dangerous or alarming symptoms; and it would therefore seem that the more aggravated constitutional affections, which sometimes accompany their existence, have not so necessary a connexion with these fungi as cause and effect, as they are owing to meningeal and cerebral inflammation, and extravasation of lymph into the ventricles, as the effect of such inflammation occasioning pressure of the encephalon, and thence giving rise to the various symptoms connected therewith. This affection rarely takes place, unless great injury has previously been sustained by the brain and its membranes; and a frequent cause appears to be the laceration of the meninges, from points and edges of the broken pieces, and spiculæ of bone detached from the inner table of the skull, and penetrating into the substance of the brain. Another circumstance favouring its occurrence, is the loss of a considerable quantity of bone, more especially if at the same

sidered as consisting, for the most part of coagulated blood. By the older physicians they were supposed, from their pulsatory motion, to be aneurisms; others imagined them to be occasioned by an ulceration of the cerebral mass, whilst some are of opinion that they are mere excrescences, occasioned by a morbid action in the vessels of the brain. It would appear, however, from the most generally received notions, that the opinion of Mr. ABERNETHY in relation to this subject, is not supported by the concurrent sanction and experience of others; nor does it appear to comport with that accuracy of observation and just discrimination, which we might reasonably look for in a gentleman of such reputation and experience in his profession as Mr. Abernethy. His opinion appears to be that these cerebral tumours consist of coagulated blood, effused from some wounded or diseased vessel beneath the surface of the brain. Relating the case of a young man who had died of this disease, he remarks that upon examining the tumour it was found larger than before, and of a dark colour, with an irregular granulated surface, which appearance seemed to be owing to coagulated blood which adhered to its surface, as the part had bled so much that one-half of the cap which the man had worn, was rendered quite stiff by it. "A part of this tumour being cut off where it was lacerated, appeared to consist of coagulated blood of a fibrous texture."

His reasoning and deductions from these premises are as follows:—

"The appearances on dissection clearly explain the cause of the symptoms which had taken place, and rendered it evident, that the disease under which this man had chiefly laboured, was inflammation of the pia mater. The nature of the tumour, also, was not less satisfactorily pointed out. It was plain, that in consequence of the brain being injured to some depth beneath the surface, disease of the vessels and consequent effusion of blood had ensued; that the effusion was, for a while, restrained by the superincumbent brain and its membranes; but these gradually yielded to the expansive force exerted from within, and at last giving way altogether, the fluid blood oozed and coagulated upon the surface of the tumour. It appears very probable that the disease frequently described by the term *hernia cerebri*, consists, as in this instance, of a tumour formed by coagulated blood; for an organized fungus could hardly be produced in so short a time as that in which these tumours are generally formed."

From a note subjoined at the end of his observations on this complaint, it appears that Mr. Abernethy himself only considered that form of this disease which corresponds with the above description, as a sub-species, and one, it would seem, of rather rare occurrence. He observes, in his note, that he never meant, in the recital of the cases above referred to, to deny, that the surface of the brain, when exposed and irritated, would throw out a vascular fungus; and that

time a laceration of the membranes should have taken place; from both these causes, the natural support of the brain is taken away, and an increased momentum of blood being determined to the part by the excited and inflammatory action of the vessels; the latter, instead of a healthy secretion, throw out this exuberant and fungus excrescence.

Previously to its appearance, however, where the intellect is unimpaired, the patient is affected with more or less fever, preceded by shivering and chilliness, and accompanied with pain in the head. "His countenance is of a pale, dirty, cadaverous yellow. As the tumour increases, he has frequent sickness, is giddy, and reels like a drunken man." After this, the pulse becomes slow and weak; he betakes himself entirely to bed, being no longer able to sit up; his mind becomes wandering and incoherent; he lies oppressed, and his pulse is a mere tremulous motion of the artery. In more aggravated cases, the symptoms of compression and irritation of the brain are more considerable and violent. The patient becomes delirious; is incapable of performing any voluntary motion; the muscles of the face and limbs are affected with convulsions; the countenance is distorted; the eyelids fixed and squinting; the jaws are spasmodically closed, or affected with convulsive motions, occasioning an involuntary grinding of the teeth. The tongue is either paralytic, or rigid with spasm, and articulation thereby rendered impracticable. Sometimes the convulsions extend to the whole body, and there is a perfect opisthotonos.

Where this affection comes on from gun-shot wounds of the head, in which the skull and membranes of the brain have been much broken and lacerated, accompanied by symptoms of constitutional derangement above mentioned, the event is often, and perhaps generally fatal. But when in cases where these symptoms have come on to a considerable degree, provided the person has been previously healthy, and the constitution unimpaired by sickness or intemperance, the danger may often be subdued, and life preserved by proper treatment.

Post mortem examinations in this disease have discovered traces of high inflammation in the pia mater, and the ventricles of the brain filled with a serous fluid, mixed with blood.

With respect to the nature and causes of *hernia cerebri*, considerable difference of opinion exists among practitioners of the present day; this want of unanimity in theory has accordingly led to a corresponding diversity of practice. By some, these affections are con-

* Charles Bell, *Operative Surgery*.

it was only intended to describe a species of those appearances which had been denominated fungus or hernia cerebri. He further remarks, that in all the cases of true fungus cerebri which he had seen, when he first wrote the foregoing, the fungus grew so slowly, that it could not be mistaken or confounded with the appearances which took place in the cases he had cited. With what reason or propriety then, could Mr. Abernethy presume to erect a subordinate variety of this disease into a generic character, and founding thereon its causes, nature, and mode of treatment? Mr. Abernethy objects to this fungus being an organized substance from the rapidity of its growth. But, in answer to this, it may be remarked, that it is the nature of most fungi and excrescences to be extremely rapid in their growth. The part thus produced being destitute of healthy granulations, there is; consequently, not required in its formation that perfect elaboration of sound, assimilated, animalized secretion, which takes place in every portion of the body when unaffected by morbid action. I do not, however, pretend to deny, that fungus-like excrescences from the brain, simulating hernia cerebri, have never occurred; though it is presumable that such cases are rare, and as they are easily distinguished, ought not to be confounded with the disease under consideration. The same may be said of that protrusion of the cerebrum and its meninges proceeding from internal suppuration, and consequent collection of matter beneath the surface of the brain. It is, however, possible, and even probable, that in some cases these fungi and abscesses may have a cotemporaneous existence: from the pressure of the membranes, against the rough and sharp edges of the bones, where the fracture had taken place, their integrity is destroyed by sloughing and suppuration, and the abscess may thus find its way into the substance of the brain; at the same time, a locally increased, vascular, inflammatory action existing, a fungus excrescence shoots up, instead of a deposition of healthy granulations.

In this affection there is always observable a very considerable pulsation in the part; not depending, as Professor BLUMENBACH, and the older physiologists believed and affirmed, with respect to the motion of the brain, upon the process of respiration, but produced entirely by the action of the arteries. That any doubt should ever have been entertained in relation to this matter is, indeed, the more astonishing, since, to the senses themselves, this cerebral motion is in perfect synchronous correspondence with the action of the arteries in other parts of the body. One thing worthy of observation in hernia cerebri is, that the more rapid the growth of this excrescence, the more perceptible and stronger, is this pulsation; showing that there

exists an increased determination of blood to the part, in the same way as in other instances of local inflammation and excrescences.

As far as my own observation extends, I am warranted in the opinion that this disease consists of a fungus excrescence from the brain, in consequence of preceding violence done to this organ, followed by increased vascular action in the part affected, producing an exuberant secretion of cerebral matter, which, being unrestrained in consequence of the deficiency of the natural support and covering of the brain, protrudes through the opening in the skull, and rises in the form of an unsightly mass above the surrounding integuments of the head. Upon removing excrescences of this description with the knife, they have appeared to be perfectly organized, of the colour and consistence of the cineritious portion of the brain, plentifully supplied with blood-vessels both arteries and veins, and which bled freely on being divided. If these fungi were merely lumps of clotted blood, according to the notion of Mr. Abernethy, we should never find such a perfect resemblance to the organization of living matter. True, they are in a great degree, and perhaps entirely insensible; but so, likewise, I believe, is the substance of the brain; and the same thing holds true with respect to various other healthy organizations of the body, as the bones, cartilages, fat and marrow. In further proof of the vitality and organization of hernia cerebri, I have known them after having protruded through the opening in the cranium, and acquired considerable size, become firmly attached to the integuments of the head and the surrounding parts; thence deriving an increase of vascularity and nutrition from the anastomosis of vessels, and to which the same increased and morbid action was communicated. I know it was the opinion of Mr. Hunter, an opinion subsequently adopted by Mr. Abernethy and others, that a coagulum of blood, formed by accidental extravasation in any part of the body, might subsequently become a living organized substance, possessing its own blood-vessels and nerves, with a principle of individual increment and nutrition, and thus laying the foundation for tumours and excrescences. In the course of his experiments and observations, instituted with a view to establish a living principle in the blood, Mr. Hunter was naturally induced to attend to the phenomena which took place, when that fluid was extravasated, whether in consequence of accidental violence or other circumstances. The first change which took place he found to be coagulation: and the coagulum, thus found, if in contact with living parts, according to Mr. Hunter, did not produce an irritation similar to extraneous matter, nor was it absorbed and taken back into the circulation, but, in many instances, preserved its living principle,

and became vascular, receiving branches from the neighbouring blood-vessels for its support; it afterwards underwent changes, rendering it similar to the parts to which it was attached, and which supplied it with nourishment. Mr. Hunter's opinion was, that when these coagula are not disturbed by the motion of the parts, they readily formed an intimate attachment through the intervention of new-formed vessels. But that when there is considerable motion in the part where this coagulum takes place, the attachment becomes diminished by the friction, rendering it, in some instances pendulous, and in others breaking it off entirely. This circumstance he illustrates by an instance which occurred in the examination of a dead body, in which, upon dissection, "there appeared lying upon the peritoneum a small portion of red blood, recently coagulated; this, upon examination, was found connected to the surface upon which it had been deposited, by an attachment half an inch long, and this neck had been formed before the coagulum had lost its red colour. This, steeped in water so as to become white, appeared like a pendulous tumour." In this way he explains the formation of those pendulous bodies, which sometimes occur attached to the inside of circumscribed cavities, as the knee-joint, for instance, the extravasated blood assuming the nature of the part in which it is effused. The cartilages in the knee-joint, therefore, appeared to him to originate from a deposite of coagulated blood upon the end of one of the bones, which had acquired the nature of cartilage, and had afterwards been separated. Mr. Abernethy, who adopts this opinion, pursues the subject as follows:—

"Had vessels shot through the slender neck, and organized the clot of blood observed by Mr. Hunter, it would then have become a living part, it might have grown to an indefinite magnitude, and its nature and progress would probably have depended on the organization which it had assumed. I have in my possession, a tumour, doubtless formed in the manner Mr. Hunter has described, which hung pendulous from the front of the peritoneum, and in which the organization and consequent action have been so far completed, that the body of the tumour has become a lump of fat, whilst the neck is merely a fibrous and vascular texture. There can be little doubt that tumours form every where in the same manner. The coagulable part of the blood being either accidentally effused, and deposited in consequence of disease, becomes afterwards an organized and living part, by the growth of the adjacent vessels and nerves into it. When the deposited substance has its attachment by a single thread, all its vascular supply must proceed through that part; but in other cases the vessels shoot into it irregularly at various parts of its surface. Thus, an inorganized concrete becomes a living tumour, which has at first no perceptible peculiarity as to its nature, though it derives a supply of nourishment from the

surrounding parts; it seems to live and grow by its own independent powers, and the future structure which it may acquire, seems to depend on the operation of its own vessels. When the organization of a gland becomes changed into the unnatural structure which is observable in tumours, it may be thought in some degree to contradict those observations; but in this case the substance of the gland is the matrix in which the tumour is formed."

It unfortunately often happens with men of ardent minds and sprightly genius, that in their investigations after truth, or in the pursuit of a favourite hypothesis, some fitful and dazzling idea strikes their fancy with peculiar force, and is immediately seized upon as the golden key to unlock the storehouse of true knowledge and philosophy. Thus our great and much respected countryman, Dr. RUSN. fancied that by his *unity of disease*, he was enabled to explain and elucidate every obscurity, and to reconcile every apparent diversity and contradiction in medical science: had he, moreover, been successful in discovering a *unity of remedy*, the grand consummation of the healing art would have been complete. There is still, however, one consolation left to the memory of departed worth, that, in this respect he has not been more unfortunate than his predecessors. What now remains of the fine wrought theories of BOERHAAVE, CULLEN, BROWN, and a host of others, built with so much ingenuity and labour? Nothing but prostrate ruins, which, unable to support and maintain the edifice they were intended to perpetuate, lie neglected: and are passed unheeded, except as monuments of the fleeting duration of man's boasted pride and ambition.

In this way, I apprehend, Mr. Abernethy has been led astray, by attaching too much confidence to the doctrine of Mr. Hunter, in relation to the vitality of the blood. Yet, if I understand him correctly, there can be but little difference between a coagulum of blood accidentally formed in any part of the body, and a regularly organized substance; since, according to his doctrine, the coagulum itself, in time, becomes organized, being furnished with nerves and vessels from the neighbouring parts. It would seem that an opinion so much at variance with the observation and experience of almost every surgeon, would scarcely gain sufficient credit to stand in need of refutation; yet, when a notion, however erroneous, has the sanction of authority to support it, it ceases to be trivial and unimportant. It must be familiar to every practitioner in surgery, that an effusion of blood, from wounds, or other causes, and the consequent formation of coagula in any part of the body, so far from becoming organized, and consolidated with the neighbouring parts, acts as extraneous matter:

tric lamina, as the coagulum of an aneurism is. The blood never bursts from its surface, as it should do even from a venous tumour, which had power in the first instance to burst the membranes of the brain. It is affected like spongy granulation from caustic. A degree of compression, equal to the compression of a considerable artery, will not subdue it when its growth has got head. 5. It has a fibrous structure, and when it is dissolved in death, it hangs in shreds, not like a coagulum. Lastly, the peculiar disposition to this disease is not shown merely in the tumour, but is evident on the margin and inner side of the ulcerated cavity."

Some have contended that the external protrusion is vicarious of more serious internal injury, which would otherwise give rise to apoplexy. Mr. Abernethy's opinion was, that this apoplexy would be occasioned by the effusion of blood into the substance of the brain, were it not that the deficiency of bone allows it to expand, by pressing the surface of the brain and its membranes through the vacant space. This, however, is all extremely problematical. As the cavity of the cranium, in its natural state, affords no vacuum, should any morbid action take place in the substance of the brain, giving rise to the production of a tumour or excrescence, is it not fairly presumable, from what takes place in other instances and situations, that the growth of the latter would be accompanied by a corresponding absorption and diminution of the former? Such a growth would, doubtless, be productive of derangement in the functions of the nervous system, and might, by its unnatural irritation, give rise to convulsions, but without occasioning apoplexy by its general compression upon the encephalon.

Much uncertainty still exists with respect to the mode of practice in this disease. Mr. Abernethy advises not to interfere with the treatment of the complaint, unless some bad symptoms should precede the appearance or accompany the continuance of the tumour. But if the tumour continues to increase, and if the patient suffers a train of bad symptoms, apparently arising from irritation and pressure made on the brain, going upon the notion, that the coagulum, of which he supposes the fungus to consist, is enlarged internally, or that by plugging up the orifice in the bone, it prevents the escape of some fluid collected within the cranium, in such cases he advises to enlarge the opening in the bone in proportion to the extent and increase of the tumour. The only apprehension of Mr. Abernethy in relation to such practice, appears to be from excessive hæmorrhage. "But although by thus allowing a free escape to the effusion of blood, we may prevent the injurious effects of its pressure on the brain, yet the de-

gree of hæmorrhage may endanger the life of the patient." It is well that Mr. Abernethy "either feigned or felt" danger in any way from such practice, lest the young and inexperienced might have been led from his recommendation into a measure as painful and imprudent as it would probably be hazardous and unsuccessful. Yet I am far from thinking that Mr. Abernethy has attributed the danger to be apprehended from this mode of treatment to the right cause; and as in the first instance he was wrong in theory, so, in the second, he is correspondingly erroneous in practice. Such a recommendation coming from a gentleman of less reputation than Mr. Abernethy, would be looked upon as grossly empirical and absurd. Thus, if we were to pursue the plan here suggested, "to enlarge the opening in proportion to the extent and increase of the tumour," we might go on removing the portion of cranium circumscribing the excrescence, till the latter might exceed the bounds of all reasonable calculation; for as this tumour seems to be confined and limited in its extent by the unyielding circumference of the opening, we may with probability presume that were this limit to its expansion removed, the tumour would proportionably increase in its dimensions. Where the hæmorrhage is considerable, or, in other words, where the growth of the *hernia cerebri* is rapid, Mr. Abernethy recommends the removal of the *coagulum*, or the tumour, and to expose the cavity in the brain, in order to learn whether suffering some sudden loss of blood to take place, together with the exposure of the bleeding vessel, might not produce a beneficial change, and a cessation of the hæmorrhage, in the same way as the removal of the dressings from wounds in other instances, and the exposure of the bleeding vessels to the air, puts a stop to the further effusion of blood. This, however, appears to be completely hypothetical, unsupported by probability or experience.

I come now to speak of the practice of removing such tumours by excision. It is now sufficiently ascertained that little danger is to be apprehended in the free removal of such tumours with the scalpel. The benefit thence resulting may be ascribed to two causes.

1. The local depletion of the vessels of the part, caused by the hæmorrhage, in the same way as topical bleeding, by cupping, and leeches, relieves local inflammation in other instances and situations.
2. The diminution of the quantity and impetus of blood to the part, in consequence of the lessened demand for the supply; for as the tumour is a morbid growth, every portion of this that is removed must proportionably lessen the extent and amount of diseased action. This practice has been long recommended in books, though but little pursued in practice. Mr. Charles Bell, in his *Operative Surgery*, says.

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if in small quantity, it is absorbed, as if the coagulum is too large to admit of being removed by the absorbents, it acts as an unnatural irritant, giving rise to inflammation and suppuration. Thus, we often observe, that a part of the body, that has been wounded and bruised, distended and tense with coagulated blood, thrown out from blood-vessels that have been ruptured by the violence. If the part be cut into, as is frequently necessary in wounds of the head, we find that this swelling is occasioned, in a great degree, by the cause here stated; yet in a few days, in favourable cases, this effused blood is all taken up by the absorbents, and eliminated from the system as extraneous matter. In the early part of my practice I once attempted to heal a deep incised wound full of coagulated blood; the wound had been received some considerable time before I saw it, and the coagulum was hard, and firmly united to the neighbouring parts. Finding it somewhat difficult to remove this coagulum, I brought the edges of the wound together by the interrupted suture; but I was disappointed in expecting a union by the first intention; the part inflamed, became swollen and painful; I now found it necessary to open the wound and remove the coagulum, and subdue the inflammation and promote suppuration by the use of emollient poultices. So much for Messrs. Hunter's and Abernethy's coagulum becoming an organized portion of the body.

In corroboration of the above opinion I am happy to adduce the testimony of Mr. Charles Bell. Upon this subject he remarks as follows:—

"The observations which I have made, and the opinion I have formed, are so different from those of Mr. Abernethy, that I think myself called upon, in some degree to extend the consideration of the subject." * * * "I have dissected a case very much resembling that described by Mr. Abernethy, in which the section of the brain around the root of the tumour showed many spots of extravasation; and it would readily occur to any one, that this tumour had been occasioned by one of the larger vessels giving way, and pouring out a coagulum. But these spots of extravasated blood attend most ulcerations of the substance of the brain." * * * "Mr. Abernethy conceives that the bursting of the vessel within the brain is a consequence of the blow; but I have seen the disease arise after a venereal caries of the skull, in which the whole thickness of the bone had exfoliated. Further, the surface of this tumour bleeds when torn or cut. Not only it bleeds if it be torn off, but the abraded surface bleeds. This is not like a coagulum. 2. It shrinks and collapses upon death, which is certainly a mark of a part having circulation within it. 3. I have a preparation of this disease, where an ulcer passes from its base into the lateral ventricle, and where the ulcer communicated outwardly, and yet no drop of blood or coagulum was seen upon the surface of the brain, or in the cavities. 4. It is not formed of concen-

"the tumour should be cut off freely." It has been objected to this operation as a practice liable to produce dangerous and fatal hæmorrhage.* Such an accident, however, appears to be more imaginary than real. If there were any well-authenticated instances of death produced by such a cause, there would then be serious grounds for apprehension; but as no such cases have come within my knowledge, I must regard the objection as gratuitous and unfounded. I have myself repeatedly removed such excrescences with the knife, without any pain or inconvenience to the patient; and as to the hæmorrhage, it was very inconsiderable, the vessels of the part being small, and soon closing from exposure to the air. In confirmation of this practice, the following case is in point. It is quoted by Mr. Abernethy from the *Mémoires de l'Académie de Chirurgie*.

"A young man received a blow on the right parietal bone, which occasioned a fracture; some bone was removed, and a hernia cerebri was afterwards produced, which was repeatedly pared down with the knife. On the thirty-fifth day from the accident, the patient having intoxicated himself, while in this state, slipt his hand under the dressings, and laying hold of the protruding coagulum, (fungus,) tore it away with violence. The next day the surgeon found that almost the whole of what he considered as corrupted brain was removed, and a vacancy left so deep that he could see nearly to the corpus callosum. From this time forwards the parts went on healing, until they got quite well; but the patient continued to labour under a paralysis of the left side, which had supervened the day after he received the blow."

As the inflammation surrounding the fungus is frequently attended with suppuration, and as the tumour by completely plugging up the opening in the bone, prevents the escape of the water, we hence see an additional reason for making a free excision of the tumour down to its base. Mr. Bell, in his surgical cases, says "he was obliged to shave away the tumour, and to push a lancet into its root as often as the stupor and other symptoms showed that matter was lodged there, by which the patient was uniformly relieved, and afterwards recovered."<†

* Speaking of the advice of Mr. Bell to cut the tumour freely, Dr. Dorsey says, "This, I conceive, could not answer any good purpose, and would probably be productive of very copious hæmorrhagy, which in the exhausted state of the patient might prove fatal."

† This recommendation of pushing a lancet into the substance of the brain, in order to arrive at the matter situated beneath, might appear rash and hazardous; but provided the brain near the origin of the nerves is not disturbed, there is no immediate danger to be apprehended from wounds of its convex surface: thus, in cases of hydrocephalus internus I have several times plunged an abscess

But there is another and more powerful way of controlling this morbid action, where the hernia cerebri is accessible and partial, viz. by pressure; this method is sometimes resorted to in cases of tumours in other situations, and in some instances of local inflammatory affections. Although this practice in the treatment of fungus or hernia cerebri is not altogether new, yet among the older authors we find it only casually mentioned as a doubtful expedient, that might be resorted to by way of experiment, but not recommended with that confidence and assurance in which a physician feels warranted in favour of a remedy of known utility and importance. Nor is the practice in this particular much better established at the present time. We find, however, an exception in Mr. Charles Bell, who, in relation to this subject, observes "the tumour should be cut freely off; and after this, there should be slight and equable pressure." * * * "When I say the tumour should be cut off, I should more fully express that pressure is absolutely necessary." This pressure should be sufficient to repress the growth and protrusion of the tumour, without being so great as to produce uneasiness, pain, or any unfavourable symptoms. This, however, must be obvious to every practitioner of ordinary discretion. Some have represented this mode of treatment as dangerous, but in the few trials I have made of it, I have not found it to be productive of the slightest inconvenience; whilst at the same time, it completely succeeded in suppressing the growth, and eradicating the fungus, after repeated removals of the tumour with the knife had failed. The manner in which this pressure should be made, is not perhaps material. I have myself made use of pressed sponge, agreeably to the advice of Dr. DUDLEY of the Transylvania University. A piece of lint, spread with simple cerate or basilicon, is applied next to the tumour, and a flat piece of sponge made to correspond with tolerable accuracy to the opening in the skull through which the hernia protrudes, is placed over this, and the whole secured with proper bandages passed round the head, and under the jaws, in such a way as the discretion of the surgeon may best dictate.

Previously to the application of this pressure, however, it will be necessary to shave off the tumour to a level with the skull, or rather to a level with its interior, concave surface, which may be easily done by causing the patient to keep his head in a depending position, whilst we are using the scalpel; by this position, the fungus, by its own weight and the pressure of the brain, is forced and drawn out to a greater length, and

lancet, through the meninges and the envelope of brain covering the effusion, without thereby giving rise to any untoward symptom.

we are thus enabled to remove it more completely. After this pressure has been continued two or three days, the excrescence will be found to have receded, and shrunk within the cranium, and in place of the tumour will be left a hole, or cavity in the brain. Upon observation, it will appear that the pulsation of the part has become much less considerable, corresponding with the healthy arterial action: so that the disposition to the formation of this fungus being subdued, the cavity has only to fill up with a deposition of healthy matter, fit for the various necessities and functions of the nervous system. We might here enquire in what manner does pressure act in removing and in preventing the growth of *hernia cerebri*? The removal appears unquestionably to be the result of absorption; and whether this is effected by veins or lymphatics is not material to the purpose. According to commonly received opinions, such a removal of excrescence would be ascribed to increased activity of the absorbents; but if we suppose what is equally, and perhaps more probable, that the pressure made upon the vessels controls and impedes the further deposition of morbid matter, the action of the absorbents remaining the same, will soon be adequate to the removal of the matter forming the fungus. However this may be explained, it is more interesting and important to know that the effect of pressure in preventing the growth of *hernia cerebri* is too well established to admit of any doubt. Sometimes these fungi may be suppressed and removed by pressure made with strips of adhesive plaster, drawn with a degree of tension over the tumour, and secured to the integuments on both sides of the opening.

A few weeks since I had a case of this description. It occurred in a negro girl, about ten years of age, who had been knocked down insensible, by a tree falling and striking her on the head. The skull was extensively fractured in every direction, and a portion of the parietal and frontal bones, about half the size of the palm of the hand, depressed and driven in upon the brain, and a small quantity of the latter escaped at the wound. The fractured pieces were removed, the depressions elevated, and the ordinary dressings applied. None of the integuments were removed, as was the practice of Mr. POTT, and the surgeons of his time.* A few days after the accident, a

* I apprehend that the practice of removing the scalp in cases of injury of the head requiring the use of the trephine, is not yet entirely laid aside. It is a little surprising that a surgeon of Mr. Pott's good sense should ever have recommended such a measure. Every consideration urges the propriety and importance of preserving the scalp, even in cases where it has been extensively torn and lacerated. In the first place, where the integuments are preserved, much time is gained in the healing of the wound; secondly, the cure is more

fungous protrusion took place at the point where the greatest injury had been inflicted, attended, as usual in such cases, with strong arterial pulsation of the part. In subduing the fungus, I employed no other means, than, at each dressing, confining a strip of adhesive plaster over the protrusion: in this way the hernia in a few days disappeared, and the child recovered.

Perhaps pressure may not be equally necessary and proper in every case of *hernia cerebri*. There may be instances in which even a moderate degree of compression might prove prejudicial. If any such should occur, they must be such as from the first have been attended with great constitutional disturbance, together with great local irritability of the part more particularly affected. Thus, two cases are quoted by Mr. Abernethy, one recorded by SCULTEURS, in his *Armentarium Chirurgicum*, Obs. XIX.; the other in the *London Medical Journal*, No. X. p. 277, in which repeated attempts were made to prevent the growth of the tumour by compression: one patient died at the end of a month, the other not until nearly six months after the accident. In the brain of each was found, upon dissection, a large cavity, which had been formed by the accumulation of a fluid that could not escape, on account of the aperture of the bone being closed by the tumour. I think, however, the reason of the failure in the two instances here mentioned is sufficiently obvious; since it appears, that pressure was used, without the precaution of previously cutting off the tumour; we are, therefore, not surprised that failure should have taken place; for it often happens that the local irritability and general irritation increase in proportion to the growth and extension of the tumour; and to apply pressure under these circumstances, would inevitably aggravate the disorder already existing in the nervous system. But by previously cutting off the fungus to a level with the interior concave surface of the skull, we at once remove a source of great irritation, and at the same time allow room for the exit of matter, should any have formed in the vicinity of the part. The tumour in this manner being removed, pressure might now be applied with a

perfect; for, instead of an ugly cicatrix, bare and naked, the sound integuments covered with hair remain, and no trace of the injury is left but a narrow seam. Nor is the removal necessary in order to facilitate the operation, or for the purpose of rendering the subsequent dressings more convenient: for whatever advantage may be gained in this way, will be entirely on the part of the operator, to the great injury and expense of the patient: and should any inconvenience arise from thus preserving the scalp, it is much better to make the incision and dissections a little more freely, than to occasion the irreparable injury of entirely removing the integuments over the seat of the injury.

reasonable and almost certain prospect of success. The length of time for which it may be necessary to use it, will depend upon the effect produced; the object being to restrain the morbid action, and to prevent the cerebral growth from rising above the proper level; thereby affording time for the membranes, which are here deficient, to form and extend themselves over the newly-organized cerebrum. It would seem that hernia cerebri has its seat not altogether in the superficial vessels of the brain, but at some depth beneath the surface; for when the morbid action which supports it is subdued, a considerable cavity occupies the seat of the tumour; this gradually fills up with a healthy organized deposite of cerebral matter. During this process, all applications, as washes, dressings, &c. to the cavity, should be avoided, and a simple plaster of basilicon applied over the opening, to protect the brain beneath from the action of the air.

ART. X. *Method of treating Fracture of the Thigh Bone.* By WILLIAM C. DANIELL, M. D. of Savannah, Georgia. [With a plate.]

IN the summer of 1819, I was called into the country to see a child of Mr. Harboch's, about seven months old, whose left thigh had been obliquely fractured near the middle of the bone, by the nurse falling with him in her arms. I applied the many-tailed bandage with four thin splints about three inches long, to confine, as well as I could, the broken ends of the bones in apposition.

Upon visiting the child the following day, I found the fractured limb about the third of an inch shorter than the other, from the lapping of the ends of the broken bone. The patient being feverish, a laxative was directed. The dressings were renewed from time to time for about a week, when the feverish symptoms had subsided, and the child become in some measure reconciled to his confinement.

The shortening of the limb still continuing, rendered it necessary to adopt some means to counteract the contraction of the muscles, and retain the ends of the broken bone in apposition. The heat of the season, as well as the age of the patient, rendering the use of the ordinary splint, (Physick's improved Desault,) and bandages objectionable, I adopted the following mode of treatment: I passed a roller of muslin around the chest of the child several times, to which I attached a bandage on each side, and extended them above the head, and fastened them to the head-board of the bed. This was